
PRECISION FIRES
PRECISION FIRES
ROCKET & MISSILE SYSTEMS

MULTIPLE LAUNCH ROCKET SYSTEM
M270 LAUNCHER

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The Multiple Launch Rocket System M270 launcher is a full-tracked, self-propelled, self-loading launcher with on-board fire control system. Initially fielded in 1983, it is the U.S. Army rocket and missile launch platform. Dubbed 'Steel Rain' by Iraqi soldiers, MLRS had a major impact in the Desert Storm ground war. It can launch the MLRS M26 tactical, M26A1/A2 extended range, and practice rockets. It can also launch the Army Tactical Missile System (ATACMS) Block I missile. It is capable of firing 12 rockets one at a time, or in rapid ripples. The launcher carries two launch pods/containers (LP/C), each consisting of six MLRS rockets or one ATACMS missile. The MLRS M270 launcher can be configured for transport by C-141 aircraft. It is transportable by C-5 and C-17 aircraft.

SYSTEM CHARACTERISTICS: The M270 launcher has a maximum speed of 64 km / hr, with a maximum range of 451 km. It is capable of climbing a 60 degree slope and a one meter wall. It has a crew of three and can fire a 12 rocket ripple within one minute. MLRS launchers are deployed at six per battery, three batteries per MLRS Battalion for a total of 18 launchers. Launcher curb weight is 20,189 kg (44,517 pounds). Curb weight with a payload and crew is about 24,756 kg (54,528 pounds).

SENSOR / SEEKER: Not applicable

WARHEAD: Not applicable

TARGET SETS: Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, etc.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Launchers and Rockets. United Defense-Carrier Vehicle.

ACQUISITION PHASE: M270 complete for U.S. Forces. Being upgraded to M270A1.

MILESTONES:

FUE	FY 83
Milestone III	FY 83

FIELDING: Fielding of active Army M270 launchers is complete to Heavy Divisions, Corps Artillery and USFK. National Guard M270 launchers will continue fielding through FY 07 as part of the 3x6 conversion.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Darryl Colvin	darryl.colvin@msl.army.mil	(256) 876-2782
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. Dave Hicks	hicksda@saalt.army.mil	(703) 692-7203

MULTIPLE LAUNCH ROCKET SYSTEM
M270A1 LAUNCHER

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The Multiple Launch Rocket System M270A1 supports Army Transformation with the selected upgrade and recapitalization of the M270 Launcher. In addition to current MLRS munitions, the M270A1 fires Guided MLRS (GMLRS) rockets and Army TACMS (ATACMS) Block IA and II (BAT sub-munition) variants and ATACMS Unitary. The M270A1 will field to the Heavy Divisions and FA Brigades of the U.S. Forces Korea and Counterattack Force. The M270A1 upgrade starts with the remanufacture of the M993 Carrier and M269 Launcher Loader Module. The rebuilt M270 is then upgraded by adding the Improved Fire Control System (IFCS) and the Improved Launcher Mechanical System (ILMS) modifications. The upgrade extends launcher life by 20 years. The M270A1 upgrade will reduce launcher O&S costs by 38% and improve slew time by 81%. The M270A1 can be configured for transport by C-141 and is transportable by C-5 and C-17 aircraft. M270A1 was critical to the Army's precision strike capability in Operation Iraqi Freedom.

SYSTEM CHARACTERISTICS: The M270A1 IFCS mitigates electronic obsolescence and provides growth for future munitions. The ILMS provides rapid response to time sensitive targets by reducing aim time by 81% and and reducing reload time by 40%. The M270A1 Launcher has a maximum speed of 65 km/hr, with a maximum range of 483 km. It is capable of climbing a 60 degree slope and a one meter wall. It fires a 12 rocket ripple within one minute and carries two launch pod containers (LP/C). The M270A1 length is 6832mm with a width of 2972 mm. Launcher curb weight is 20,493.7 kg (45,086.2 pounds). Curb weight with a payload and crew is 26,156.5 kg (57,544.2 pounds).

SENSOR / SEEKER: Not applicable

WARHEAD: Not applicable

TARGET SETS: Counterbattery, High Payoff Targets, Enemy Air Defense, Logistics Sites, Command and Control Sites, light material and personnel, etc.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Launchers and Rockets. United Defense-Carrier Vehicle. Red River Army Depot - Remanufacture.

ACQUISITION PHASE: Low Rate Initial Production (LRIP)

MILESTONES:

LRIP III Award	JUN 00
LRIP IV Award	DEC 00
LRIP V	DEC 01
FUE:	2Q FY 02
Milestone III	2Q FY 02

FIELDING: The M270A1 is being fielded to MLRS units in the Heavy Divisions and FA Brigades of the Counterattack Force, and U.S. Forces Korea to support Army Transformation.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
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ASA (ALT)	Mr. Dave Hicks	hicksda@saalt.army.mil	(703) 692-7203

FIRE SUPPORT
BOS

MULTIPLE LAUNCH ROCKET SYSTEM
HIGH MOBILITY ARTILLERY ROCKET SYSTEM (HIMARS)

LAUNCHER

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The High Mobility Artillery Rocket System (HIMARS) is an all weather Precision Fire/ Deep Strike weapons system for early entry and future forces. HIMARS is a C-130 roll on and roll off transportable wheeled variant of the MLRS M270A1 upgrade launcher which is mounted on a five ton Family of Medium Tactical Vehicles (FMTV) truck chassis. HIMARS supports the Army transformation strategy of a more deployable, lethal, survivable, and tactically mobile force. It will launch all MFOM rockets and missiles. It has the same command, control, and communications (C3), as well as the same crew size, as the M270A1 launcher, and carries one rocket or missile launch pod/container, containing six MLRS rockets or one Army TACMS missile. HIMARS is designed to support early entry and future forces with high volume fire against time sensitive counter-fire, SEAD capability, and other high payoff targets.

SYSTEM CHARACTERISTICS: The HIMARS, combat loaded, weighs approximately 35,000 pounds. It will roll on and off a C-130 transport aircraft and be ready to operate within minutes of landing anywhere in the world. It has an on board self-loading capability. The HIMARS launcher has a maximum speed of 94 km/hr with a range of 483 km.

SENSOR / SEEKER: Not applicable

WARHEAD: Not applicable

TARGET SETS: Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, and other High Payoff Targets.

CONTRACTOR: Lockheed Martin Missile Fire Control-Launcher. Stewart & Stevenson - Carrier

ACQUISITION PHASE: Low Rate Initial Production.

HIMARS participated in RFPI ACTD field exercises in FY 98 followed by an XVIIIth ABC two year extended user evaluation. Prototypes provide the unit with limited go-to-war capability. Comments from the evaluation provided significant input to the production launcher design. HIMARS performed superbly during Operation Iraqi Freedom.

MILESTONES:

MSII/Maturation	Nov 99
MSC	Mar 03
LRIP I	Mar 03
LRIP II	1Q FY 04
FUE	2Q FY 05
FRP decision	3Q FY 05

FIELDING: Fielding of first production battalion to 3-321 FA BN, XVIIIth ABN Corps (2Q FY 05) and second production battalion to 3-27 FA BN, XVIIIth ABN Corps (1Q FY 06).

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Darryl Colvin	darryl.colvin@msl.army.mil	(256) 876-2782
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. Dave Hicks	hicksda@saalt.army.mil	(703) 692-7203

FIRE SUPPORT BOS

MULTIPLE LAUNCH ROCKET SYSTEM HIGH MOBILITYARTILLERY ROCKET SYSTEM (HIMARS) P3I

LAUNCHER

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The High Mobility Artillery Rocket System (HIMARS) Pre-planned Product Improvement (HIMARS P3I) launch platform is a revolutionary block upgrade to the HIMARS launcher. HIMARS P^{3}I is a next generation all weather launch platform capable of supporting the Future Force. HIMARS P3I may not have a backward compatibility requirement to current MLRS munitions. It is light-weight, easily deployable by air, highly mobile, with reduced workload, increased crew and launch platform survivability, and increased maintainability. The system is capable of supporting early entry and future forces.

SYSTEM CHARACTERISTICS: The system, a block upgrade Field Artillery variant of the Future Combat System (FCS), is a light weight C-130 or equivalent transportable fully combat loaded weapons platform. Characteristics include: self-locating capability; modular design for ease of HTI upgrades, maintainability and JTA-A compliance; low observable and detection/hit avoidance; integrated active and passive protection systems; variable size pods and mixed munitions launch; shoot on the move; reprogramming in-flight munitions and missions; voice activated man machine interface (MMI); strategic and tactical communications; automated trigger and reload; embedded diagnostics and training; water generation and recovery; increased reliability and redundancy; lower cost of ownership; and adaptable to changing doctrine and operational needs.

SENSOR / SEEKER: Not applicable

WARHEAD: Not applicable

TARGET SETS: High Payoff stationary or moving, hard or soft, hot or cold armor, material and personnel targets. Multi-mission and multi-battlefield zone capable.

CONTRACTOR: TBD.

ACQUISITION PHASE: Concept Definition. Projected ATD to begin FY 08.

MILESTONES:

Projected SDD	FY 10
Projected Procurement	FY 14
Projected FUE	FY 16

FIELDING: Supports Early Entry and Future Forces.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
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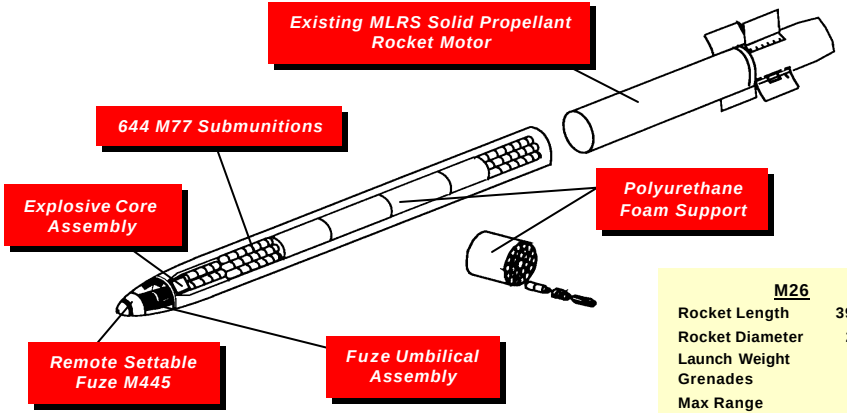
Product Manager	LTC Darryl Colvin	darryl.colvin@msl.army.mil	(256) 876-2782
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. Dave Hicks	hicksda@saalt.army.mil	(703) 692-7203

M26 TACTICAL ROCKET

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: The MLRS M26 is an unguided ballistic tactical rocket that provides all-weather, indirect fire capability designed to complement cannon weapons in the tactical fires arena. Initially fielded in 1983, it produces devastating effects in attacking critical, time-sensitive targets with large volumes of firepower in a very short time. It has been the primary munition for the MLRS M270 older launcher. Dubbed 'Steel Rain' by Iraqi soldiers, it had a major impact in the Desert Storm and Operation Iraqi Freedom ground wars.

M26	
Rocket Length	3937 mm
Rocket Diameter	227 mm
Launch Weight	306 kg
Grenades	644
Max Range	32 km

SYSTEM CHARACTERISTICS: Six M26 rockets are loaded in the launch pod/container at the factory. The six M26 rockets are shipped, stored, and fired from the LP/C. The M26 tactical rocket warhead contains 644 M77 Dual Purpose Improved Conventional Munition (DPICM) submunitions which can be deployed to cover a 0.23 square Km area. The rocket is fin-stabilized with folding fins that open during the boost phase. Initally fielded in 1983, its shelf life was extended to 22 years. Minimum range: 8 Km. Maximum range: 32 Km.

SENSOR / SEEKER: Not applicable

WARHEAD: The warhead has a remotely settable fuze and contains 644 individually exploding M77 DPICM submunitions. Each submunition has a steel fragmentation case and a shaped charge. A ribbon stabilizes the submunition during free fall and rotates a threaded arming device to arm the fuze. The armed M77 detonates upon impact. The M77 can penetrate from 76 to 102 mm of armor plate steel.

TARGET SETS: Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, light material and personnel targets, etc.

CONTRACTOR: Lockheed Martin Missiles and Fire Control.

ACQUISITION PHASE: Operations & Support (O&S) until FY 2016 for US Forces.

MILESTONES:

IOC	FY 83
Milestone III	FY 83

FIELDING: Fielding of the MLRS M26 basic tactical rocket has been completed to Heavy Divisions, Corps Artillery, and Army depots. The Army Acquisition Objective (AAO) has been met.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Stephen Lee	stephen.lee@msl.army.mil	(256) 876-5727
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

M28A1 REDUCED RANGE PRACTICE ROCKET (RRPR)

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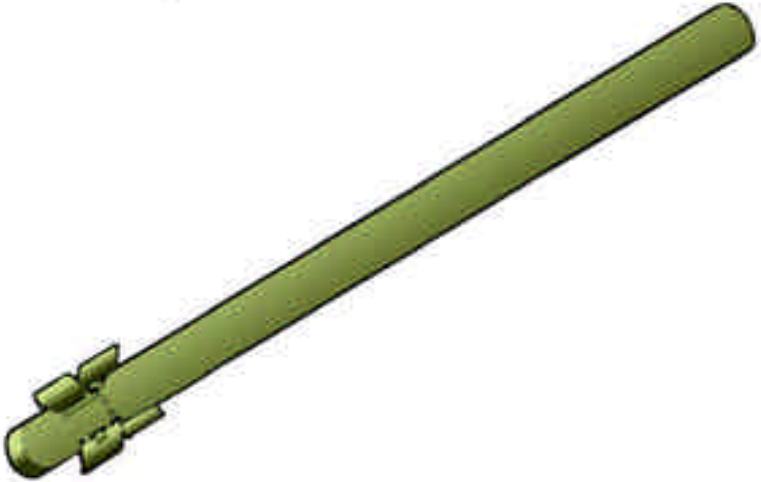

SYSTEM DESCRIPTION: The M28A1 Reduced Range Practice Rocket (RRPR) is a short-range practice rocket used to train MLRS M270, M270A1, and HIMARS launcher units. The design maximizes the number of firing ranges that can support MLRS live fire training. The rocket motor is the same one used by the M26 Tactical Rocket.

SYSTEM CHARACTERISTICS: The M28A1 design is a standard M26 rocket motor with a ballasted blunt-nosed warhead designed for training / test sites with short ranges. A special application software module is required for the launcher to recognize and launch the RRPR. Range is 8-15 Km. Stored in and launched from a launch pod / container (LP/C). Each LP/C holds six practice rockets. RRPR length is 155 inches, nine inches in diameter, and weighs 675 pounds. Ballast forward of the rocket motor is used to achieve the same weight and center of gravity as the tactical warhead.

SENSOR / SEEKER: Not applicable

WARHEAD: Ballasted - blunt nose for short-range training. Smoke Charge. A 42 gram mix of aluminum and potassium perchlorate smoke charge is activated by a point detonating fuze.

TARGET SETS: Not applicable. Practice rocket.

CONTRACTOR: Lockheed Martin Missiles and Fire Control.

ACQUISITION PHASE: Pre-production, second buy.

MILESTONES:

IOC	FY 93
2nd procurement	FY 03

FIELDING: To Army Active Duty and National Guard MLRS, M270, M270A1 and HIMARS Launcher Units.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Stephen Lee	stephen.lee@msl.army.mil	(256) 876-5727
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

M26A1/M26A2 EXTENDED RANGE ROCKET (ER-MLRS)

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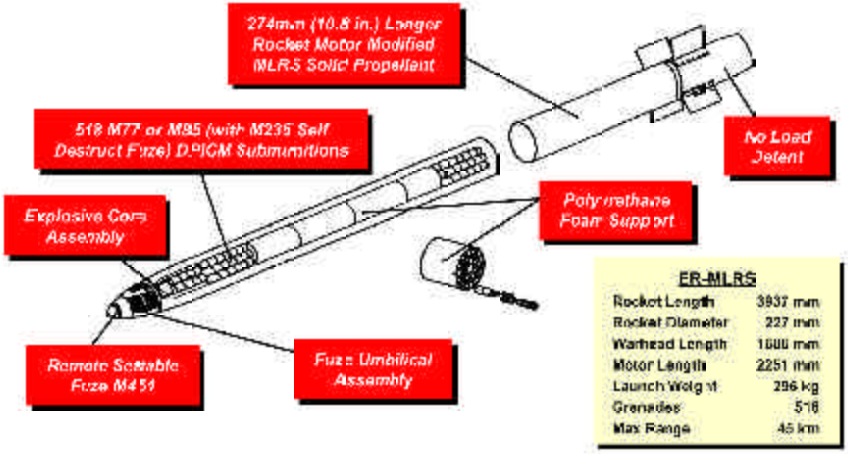

SYSTEM DESCRIPTION: The Extended Range Multiple Launch Rocket System (ER-MLRS) is an all weather unguided ballistic flight rocket designed to engage targets out to a range of approximately 45 Km. Compared to M26, the ER-MLRS has a lengthened rocket motor and smaller warhead section with fewer submunitions. M26A1 version has submunitions equipped with a self-destruct fuze to reduce hazardous duds for improved maneuver force safety. M26A2 has M77 submunitions (currently found in the M26 basic rockets). ER-MLRS was procured in very limited quantities.

SYSTEM CHARACTERISTICS: The ER-MLRS rocket is a non-precision ballistic munition. It is similar to the MLRS tactical rocket with a few changes. Greater range is obtained by lengthening the motor section to accommodate more propellant and higher altitude flight is attainable with improvements to the nose fuze. Accuracy is optimized by incorporating a new no-load detent system in the launcher pods to reduce launch tip-off errors. The Center Core Burster was modified to enlarge the size of the grenade pattern on the ground to enhance effectiveness. The shortened payload section houses 518 new M85 Dual Purpose Improved Conventional Munition (DPICM) grenades equipped with mechanical / electronic Self-Destruct Fuzes (SDF) or 518 M77 DPICM grenades. Initially fielded in 1999, its shelf-life requirement is 10 years. Minimium Range: 15 Km. Maximum: 45 Km.

SENSOR / SEEKER: Not applicable

WARHEAD: The M26A1 ER-MLRS warhead section contains 518 M85 DPICM submunitions (with M235 self-destruct fuzes). The M85 uses the same grenade body as the existing M77 DPICM submunition used in the basic MLRS. The M26A2 ER-MLRS warhead section contains 518 M77 DPICM submunitions.

TARGET SETS: Counterbattery, Enemy Air Defense, Logistics Sites, Command and Control Sites, light material and personnel targets, etc.

CONTRACTOR: Lockheed Martin Missiles and Fire Control; KDI (M235 Self Destruct Fuzes)

ACQUISITION PHASE: Operations & Support (O&S) until FY 2011 for US Forces.

MILESTONES:

Materiel Release	FY 99
IOC	FY 99

FIELDING: US production was completed in FY 99.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Stephen Lee	stephen.lee@msl.army.mil	(256) 876-5727
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

XM30 GUIDED MLRS (GMLRS) ROCKET

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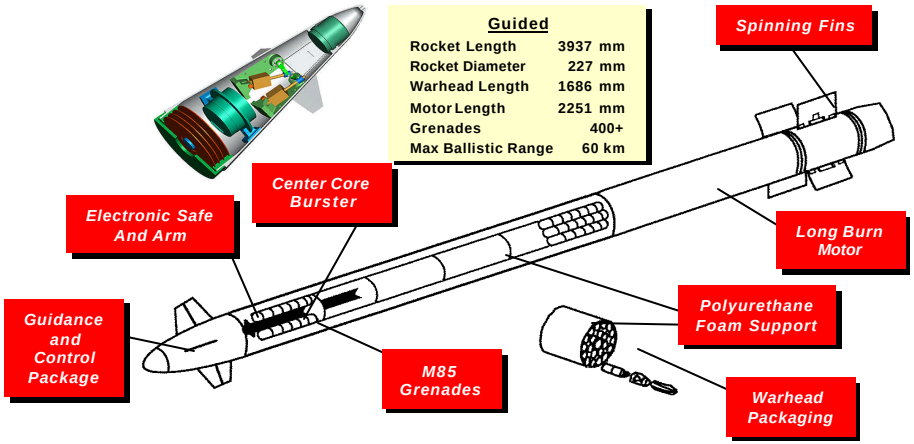

SYSTEM DESCRIPTION: The Guided MLRS (GMLRS) precision rocket is an all weather Army Transformation munition for Current to Future Forces. It replaces the M26 tactical and M26A1/A2 ER-MLRS rocket stockpile that is quickly approaching its 22 year shelf-life. GMLRS is the primary munition for the MLRS M270A1 and HIMARS launchers. It can not be luanched from the older MLRS M270 launcher. GMLRS increases M26 range approximately 100%, accuracy, and reduces the number of rockets to defeat current target sets by 80%. It greatly reduces collateral damage and logistics burden. GMLRS is the primary artillery rocket munition for the Future Force High Payoff and High Value Targets.

SYSTEM CHARACTERISTICS: GMLRS integrates a Guidance and Control (GNC) package and a new rocket motor to achieve greater range and precision accuracy. Guidance will be performed by a low-cost, tactical-grade Inertial Measurement Unit (IMU) aided by a GPS receiver. Control will be accomplished by four canards driven by electromechanical actuators. Required accuracy will be met by the IMU in an independent mode. The precision accuracy reduces the payload to 400+ grenades. A self-destruct fuze will reduce hazardous duds. Minimum range: 15 Km. Maximum range: 60+ Km.

SENSOR / SEEKER: Not applicable

WARHEAD: GMLRS provides a precision guided bus for various current and future payloads such as bomblets, mines, precision guided submunitions, and high explosive unitary warheads.

TARGET SETS: Cannon, Rocket and Missile Artillery; Enemy Air Defense; Light Armor, Material and Personnel; Command and Control Positions; Logistics Sites; and other High Value and High Payoff Targets.

CONTRACTOR: Lockheed Martin Missiles and Fire Control; Atlantic Research Corp. (Rocket Motor); Litton (Guidance Set); Lucas (Control Actuator system); TBD (Self-destruct Fuze).

ACQUISITION PHASE: System Development & Demonstration (SDD)

MILESTONES:

MS B / SDD	FY 99
MS C / LRIP I	FY 03
LRIP II	FY 04
LRIP III	FY 05
IOC	FY 05
FRP	FY 06

FIELDING: Field to HIMARS and M270A1 launcher units.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Stephen Lee	stephen.lee@msl.army.mil	(256) 876-5727
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ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

GUIDED MLRS UNITARY (GMLRS-UNITARY) ROCKET

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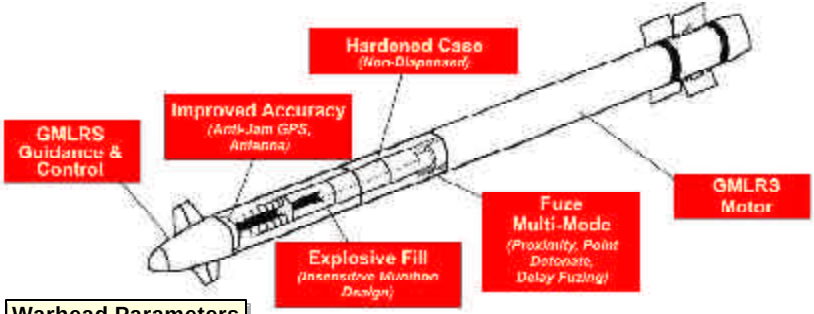

Warhead Parameters
Diameter: 8.7 in. max
Length: 43.6 in. max.
Weight: 206 lbs.

SYSTEM DESCRIPTION: The Guided MLRS Unitary (GMLRS-Unitary) is an Army Current to Future all weather, low collateral damage 15-60+ Km range precision rocket expanding the current MLRS target set to include hard point targets and targets within urban and complex environments. It is a pre-planned product improvement that will integrate a multi-mode fuze and high explosive insensitive munition into a warhead of the same GMLRS dimensions. GMLRS-Unitary satisfies a validated user requirement and will be fielded to support Early Entry and Future Forces. GMLRS-Unitary has GPS accuracy to a range greater than 60 Km. The Operational Requirements Document (ORD) was approved in November 2000.

SYSTEM CHARACTERISTICS: All weather, low collateral damage Insensitive munitions. Engagement range 15-60+ Km. Guidance will be performed by a low-cost, tactical-grade Inertial Measurement Unit (IMU) designed to be aided by GPS. Control will be accomplished by four canards driven by electromechanical actuators. Required accuracy will be met with the GPS in an independent mode. The addition of a Semi-Active Laser (SAL) seeker could enhance accuracy and give the rocket a point hit capability to engage moving targets. The high explosive insensitive munition warhead weighs approximately 180-200 lbs. Multi-mode fuzing options include airburst, point detonating, and delayed (depth of burial). Shelf life initial projection is 10 years. GMLRS-Unitary is a near pin point artillery rocket munition for the Future Force Tactical Deep Zone while overlapping a portion of both the Close Fight and Operational Deep Zones. Minimum range: 15 Km. Maximum range: more than 60 Km.

SENSOR / SEEKER: Not applicable

WARHEAD: Previously developed US Air Force high explosive small diameter bomb (SDB) or variant.

TARGET SETS: Hard stationary point targets; collateral damage sensitive soft area targets; and extends GMLRS (DPICM) target set into complex and urban environments.

CONTRACTOR: TBD.

ACQUISITION PHASE: System Development & Demonstration (SDD).

MILESTONES:

ORD Approved	FY 01
MS B / SDD	FY 03
MS C / LRIP	FY 07
IOC	FY 08
FRP	FY 09

FIELDING: Field to HIMARS and M270A1 launcher units. Early Entry and Future Force Munition.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
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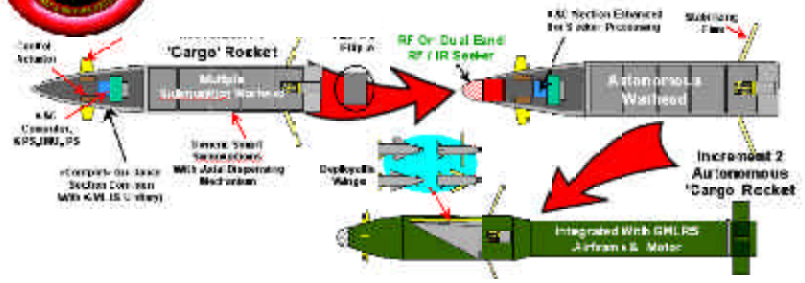
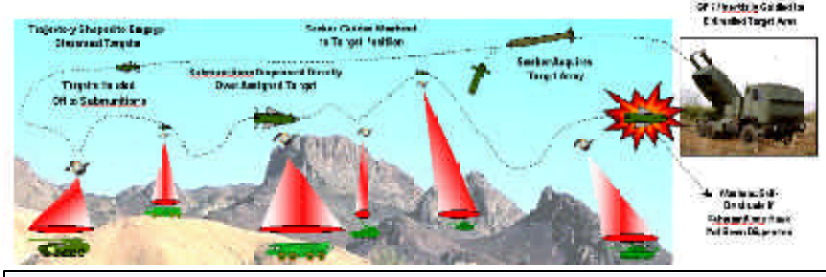
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

GMLRS AUTONOMOUS 'CARGO' ROCKET

FIRE SUPPORT BOS | ***Precision Fires Rocket & Missile Systems*** | **ROCKET**





SYSTEM DESCRIPTION: The GMLRS Autonomous 'Cargo' guided munition is an Army Transformation Future Force munition capable of engaging moving and stationary, hard and soft, dispersed point and concentrated high priority targets in all-weather, all-terrain conditions. The GMLRS Autonomous 'Cargo' Rocket will complement the GMLRS-DPICM and GMLRS-Unitary rockets to complete the MLRS Layered Lethality capability. GMLRS Autonomous 'Cargo' Rocket will integrate an all weather seeker *(Increment 2)* into a larger elliptical volume, *"cargo"* warhead *(Increment 1)*, to enable a smart, precision strike capability with low collateral damage against dispersed targets with large target location errors (TLE). GMLRS Autonomous 'Cargo' Rocket as a smart *"cargo"* munition can carry ten generic submunitions (smart or dumb, lethal or non-lethal) to a range of approximately 100 km and dispense the submunitions with exact target assignment through terminal trajectory shaping. After precise dispense, these submunitions will use onboard sensors to detect their assigned target and engage. If all submunitions are not assigned and dispensed, the warhead will self-destruct thereby assuring minimum collateral damage. GMLRS Autonomous 'Cargo' Rocket will cover the entire Tactical Deep Zone while overlapping a portion of both the Close Fight and Operational Deep Zones.

SYSTEM CHARACTERISTICS: Insensitive munition, controllable autonomous rocket bus delivering multiple submunitions payload. The rocket warhead has an onboard sensor suite that detects, classifies and assigns a specific target to a specific submunition as the warhead section is flown via trajectory shaping to the optimum dispense point for a one-on-one submunition to target assigned engagement. Candidate submunitions can carry a sensor suite to detect, classify, accept target assignment, and engage priority dispersed point and concentrated targets. Submunitions not assigned and dispensed will be destroyed by warhead self-destruct. Candidate submunitions should be near all weather capable. Initial shelf life is 10 years. Minimum range: 15 Km. Maximum Range: ~ 100 Km.

TARGET SETS: Moving and stationary, hard and soft high payoff / high priority targets.

ACQUISITION PHASE: Concept Definition.

MILESTONES: TBD

FIELDING: TBD

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC Stephen Lee	stephen.lee@msl.army.mil	(256) 876-5727
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

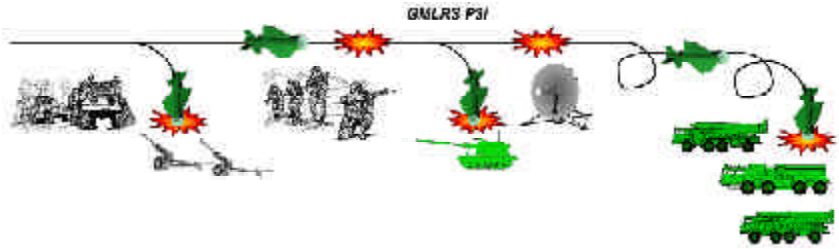
GUIDED MLRS (GMLRS) P^{3}I ROCKET

FIRE SUPPORT
BOS

Precision Fires Rocket & Missile Systems

ROCKET

GMLRS P^{3}I



SYSTEM DESCRIPTION: The Guided MLRS (GMLRS) Pre-planned Product Improvement (GMLRS P^{3}I) rocket is a revolutionary FCS block upgrade to the GMLRS/GMLRS-Unitary precision rockets. GMLRS P^{3}I is a next generation all weather smart rocket. GMLRS P^{3}I may not have a backward compatibility requirement to current MLRS launchers. The rocket has a multifunctional warhead that can destroy armor (AA), tank (AT), material (AM) and personnel (AP) stationary and moving targets. It is capable of engaging targets in multiple target areas, launch from multi-service utility helicopters and has modular design for ease of HTI upgrades and maintainability. It has increased survivability and a very low observable launch and flight signatures. GMLRS P^{3}I is capable of supporting Early Entry and Future Forces.

SYSTEM CHARACTERISTICS: The GMLRS P^{3}I smart rocket is smaller and lighter. GMLRS P^{3}I is either a smart munition and/or is capable of carrying smart submunitions. It has an engagement range of 15-120 Km, 30-year minimum shelf-life, and is air droppable. Guidance capabilities include fire & forget; programmable variable thrust, range, target location, flight path and trajectory; in-flight update; in-flight reprogramming; automatic target recognition (ATR), and multimode seeker. Warhead characteristics include modular, multiple, insensitive and adaptive payloads. Rocket and/or submunition characteristics include variable speed, loiter, self-diagnostic, and battle damage assessment (BDA) capable. Minimum range: 15 Km. Maximun range: 100 Km.

SENSOR / SEEKER: TBD

WARHEAD: Multimission, anti-tank, anti-armor, anti-material and anti-personnel.

TARGET SETS: Most Dangerous and High Payoff stationary or moving, hard or soft, hot or cold armor, material and personnel targets. Multi-mission capable.

CONTRACTOR: TBD

ACQUISITION PHASE: Concept Definition.

MILESTONES:

Projected ATD	FY 09
Projected MS B / SDD	FY 11
Projected MS C / LRIP	FY 14

FIELDING:

Projected IOC	FY 16

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
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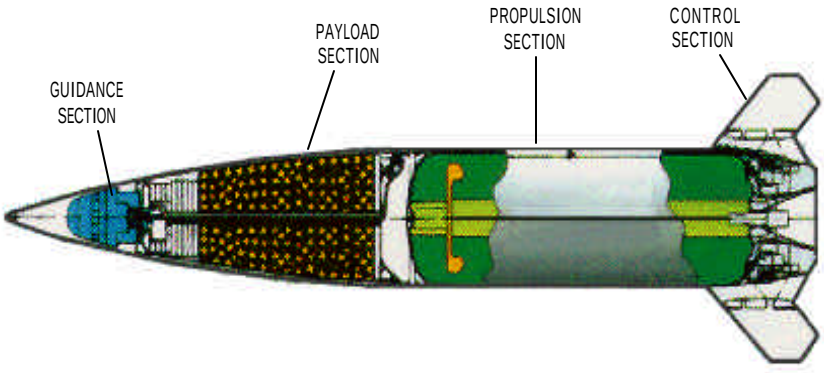
ASA (ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM
M39 ARMY TACMS BLOCK I

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The Army TACMS Block I is a surface-to-surface, inertially-guided, semi-ballistic missile fired from the MLRS launcher family. It can engage targets throughout the Corps/Unit of Employment area of influence.



SYSTEM CHARACTERISTICS: The Army TACMS Block I missile delivers an Anti-Personnel/Anti-Materiel (APAM) warhead that contains approximately 950 M-74 bomblets. There is one missile per guided missile and launching assembly and two missiles per M270A1 and M270 IPDS launcher load (one missile per HIMARS). Thrust for the missile is provided by a solid propellant rocket motor which is ignited by an igniter arm/fire device. Payload weight: 560 kg (1235 lbs), Missile Length: 3.975 m (156.5 in), Diameter: 0.61 m (23.9 in), Weight: 1673 kg (3687 lbs). Maximum Range: 165 km. Minimum Range: 25 km.

SENSOR/SEEKER: Not Applicable

WARHEAD: The Block I warhead contains approximately 950 M-74 APAM bomblets. The M-74 is a spin-armed, self-dispersing fragmentation bomblet, 58.9 mm (2.32 in) in diameter, weighing 0.59 kg (1.3 lbs). The fragmenting material is 90% tungsten alloy.

TARGET SETS: Air Defense Artillery Sites, Surface-to-Surface Missile Units, Logistics Sites, Command and Control Complexes, and Helicopter Forward Operating Bases.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Dallas.

ACQUISITION PHASE: Production, Fielding/Deployment, and Operations Support.

MILESTONES:

Milestone II	Feb 86
IOC	Aug 90
Milestone III	Nov 90

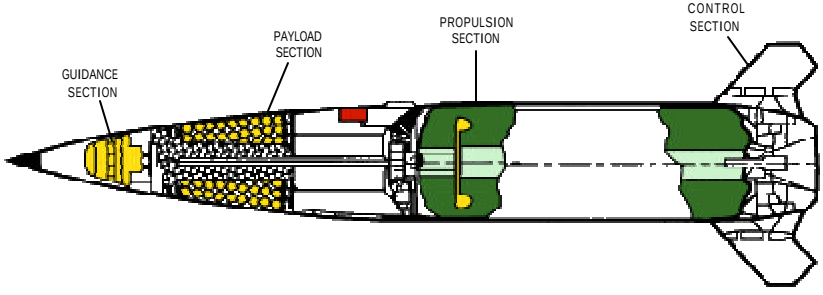
FIELDING: Army TACMS Block I Missile/Launch Pod Assemblies have been fielded to ammunition storage areas worldwide. An FMS variant of the Block I is fielded with Greece, Turkey, Korea, and Bahrain.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
APM	LTC Tony F. Hodge	tony.hodge@msl.army.mil	(256) 876-8976
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM
M39A1 ARMY TACMS BLOCK IA

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: The Army TACMS Block IA is an extended range variant of the Army TACMS Block I missile. The Block IA integrates an onboard Global Positioning System (GPS) into an inertial navigation system and reduces the payload to approximately 300 M-74 bomblets to achieve the required accuracy and extended range.

SYSTEM CHARACTERISTICS: The Army TACMS Block IA uses the guided missile control and propulsion systems of the Army TACMS Block I missile. The Block IA warhead uses a majority of the Block I warhead components. The payload of anti-personnel/anti-materiel (APAM) M-74 bomblets is reduced to extend its range. Block IA uses an improved version of the Army TACMS Block I Missile Guidance Set to achieve the improved accuracy needed to meet the Block IA system requirements. The Improved Missile Guidance Set uses an embedded GPS receiver to receive and process GPS satellite navigation signals and integrates the GPS data into the inertial guidance scheme to improve navigational accuracy. There is one missile per guided missile and launching assembly and two missiles per M270A1 and M270 IPDS launcher load (one missile per HIMARS). Thrust for the missile is provided by a solid propellant rocket motor which is ignited by an igniter arm/fire device. Payload Weight: 174 kg (382 lbs). Missile Length: 3.975 m (156.5 in). Diameter: 0.61 m (23.9 in.) Weight: 1318 kg (2,906 lbs). Maximum Range: 300 km. Minimum Range: 70 km.

SENSOR/SEEKER: Not Applicable

WARHEAD: The Block IA contains approximately 300 APAM M-74 bomblets. The M-74 is a spin-armed, self-dispersing fragmentation bomblet, 58.9 mm (2.32 in) in diameter, weighing 0.59 kg (1.3 lbs). The fragmenting material is 90% tungsten alloy.

TARGET SETS: Air Defense Artillery Sites, Surface-to-Surface Missile Units, Logistics Sites, Command and Control Complexes, and Helicopter Staging Areas.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Dallas

ACQUISITION PHASE: Production, Fielding/Deployment, and Operations Support.

MILESTONES:

Milestone II	FY 94
IOC	FY 98
Milestone III	FY 98

FIELDING: Army TACMS Block IA is fielded to ammunition storage areas worldwide.

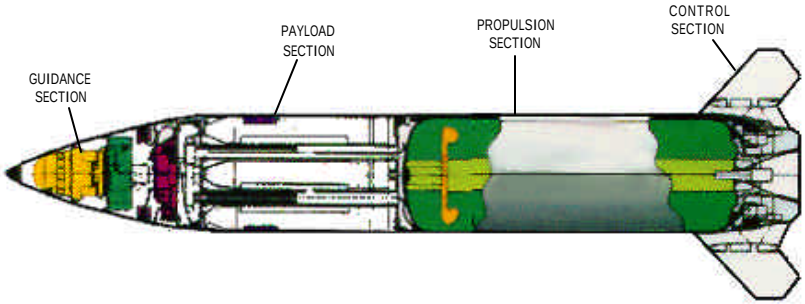
POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
APM	LTC Tony F. Hodge	tony.hodge@msl.army.mil	(256) 876-8976
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM - BAT
M39A3 ARMY TACMS BLOCK II

Precision Fires Rocket & Missile Systems

SYSTEM DESCRIPTION: The Army TACMS Block II missile is a variant specifically designed to carry 13 BAT submunitions to kill moving armored formations and cold stationary armored combat vehicles located in an assembly area.



SYSTEM CHARACTERISTICS: The Army TACMS Block II can be fired from the M270A1, M270 equipped with the Improved Position Determining System (IPDS), and High Mobility Artillery Rocket System (HIMARS) launchers. There is one missile per guided missile and launching assembly and two missiles per M270A1 and M270 IPDS launcher load (one missile per HIMARS). The Block II utilizes the Block I missile control and propulsion set, the Block IA guidance and inertial navigation set, and unique hardware and software to assure necessary missile communication with the BAT submunitions. Thrust for the missile is provided by a solid propellant rocket motor which is ignited by an igniter arm/fire device. Control of the missile during flight is accomplished by four fins located 90^{o} apart in the control section of the missile. Payload Weight: 273 kg (600 lbs) (13 BATs). Missile Length: 3.975 m (156.5 in). Diameter: 0.61 m (23.9 in). Weight: 1481 kg (3264 lbs). Maximum Range: 145 km. Minimum Range: 35 km.

SENSOR/SEEKER: Contained in the BAT Submunition.

WARHEAD: The Block II carries 13 BAT submunitions. The BAT is a non-powered, tandem shaped-charge submunition with acoustic and infrared seekers. It weighs 44 pounds, is 36 inches long and 5.5 inches in diameter.

TARGET SETS: BAT - Moving Armored Formations.

CONTRACTOR: Missile - Lockheed Martin Missiles and Fire Control - Dallas.

MAJOR SUB-CONTRACTOR: BAT - Northrop Grumman Electronic Systems.

ACQUISITION PHASE: Production and Deployment

MILESTONES:

Block II/BAT System LRIP Decision	FY 99
IOC	FY 02

FIELDING: Linited number placed in Army depots for contingency purposes.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
APM	LTC Tony F. Hodge	tony.hodge@msl.army.mil	(256) 876-8976
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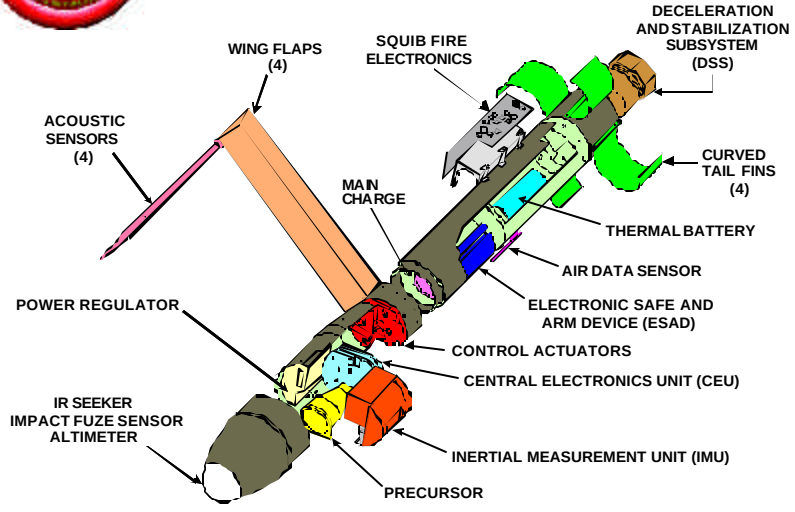
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM - BAT
M1 BAT

FIRE SUPPORT
BOS

SUBMUNITION

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: The BAT is an unpowered, aero-dynamically stable submunition that uses two types of sensors: acoustic for acquisition and infrared for terminal attack with a large target acquisition footprint. After dispense, the submunition autonomously seeks and destroys moving armored combat vehicles.

SYSTEM CHARACTERISTICS: Prior to dispense, the BAT thermal battery is initiated and the flight software and mission parameters are downloaded. After dispense, the BAT stabilizes itself, slows to acquisition speeds, and deploys its aerodynamic surfaces. The BAT acoustically acquires the target or target groups, glides to the immediate target area, and selects an individual vehicle to be engaged. The BAT follows a top-down, hit-to-kill terminal profile toward a selected vulnerable region of the targeted vehicle. On impact, the tandem conventional shaped-charge warhead is detonated, assuring a kill and collectively (with the other dispensed BATs) securing delay, disruption, or destruction of the targeted enemy unit. Thirteen BAT submunitions can be carried and dispensed by the Army TACMS Block II missile. Length: 0.914 m (36 in). Diameter: 0.14 m (5.5 in). Wing Span: 0.914 m (36 in). Weight: 20 kg (44 lbs) (in-flight).

SENSOR/SEEKER: The BAT acoustic sensor consists of four sensors in a planar, 3-foot aperture array. The signals from the hermetically-sealed microphones are combined in the central electronics unit processor in order to detect and locate the target. The BAT Infrared seeker section consists of a free gyro, a gas-bearing optical gimbal and body-fixed Mercury, Cadmium, Telluride, and Indium Antimonide detector array.

WARHEAD: The BAT warhead subsystem consists of a forward-mounted precursor charge (PC) and an aft-mounted main charge (MC). The PC neutralizes the target reactive armor prior to MC initiation. Both are LX-14 explosive shaped charges.

TARGET SETS: Top attack of moving armored vehicles (i.e., tanks, BMPs, and self-propelled howitzers).

CONTRACTOR: Northrop Grumman Electronic Systems.

ACQUISITION PHASE: Production and Deployment

MILESTONES:

Block II/BAT System LRIP Decision	Feb 99

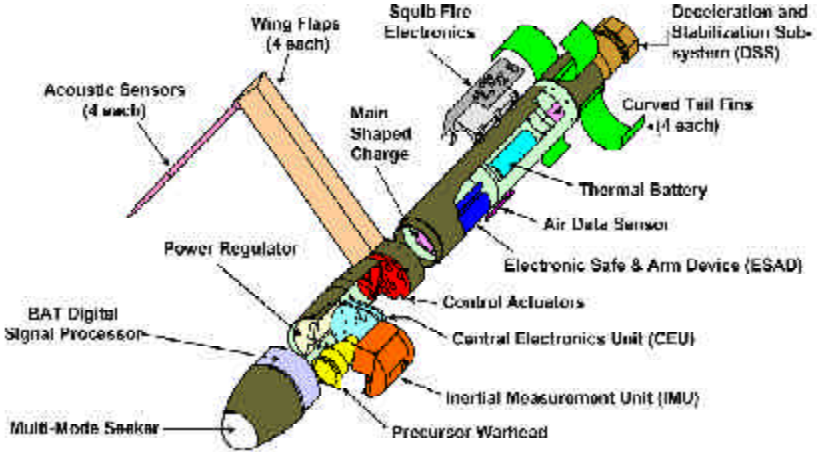
FIELDING: Limited number placed in Army depots for contingency purposes.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
APM	LTC John Oxford	john.oxford@msl.army.mil	(256) 876-2063
TSM RAMS	COL James Heverin	james.heverin@sill.army.mil	(580) 442-5205
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

EAGLE EYES
(MULTI-MODE SEEKER)

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: Eagle Eyes is an armed UAV submunition using an Advanced Imaging Infrared and Millimeter Wave Seeker providing a capability to attack moving and stationary targets ranging from armored to thin-skinned targets (MRLs, TELs, scuds, armored cars, pickup trucks, etc.) in a variety of obscured and countermeasured environments. The Eagle Eyes System is being developed to be employed off the Hunter UAV.

SYSTEM CHARACTERISTICS: The objective Eagle Eyes Multi-Mode Seeker will use a dual-mode sensor capable of acquiring and destroying moving or stationary, and hot or cold targets. The new sensor provides for improved target detection and hit point accuracy. The sensor is more robust in adverse weather and against countermeasures offering enhancements over the baseline BAT submunition. Diameter: 0.14 m (5.5 in). Length: 0.914 m (36 in). Weight: 20 Kg (44 lbs).

TARGET SETS: Armored Combat Vehicles, Moving and Stationary Targets, Surface-to-Surface Missiles, Transporter Erector Launchers, and Multiple Rocket Launchers, Armored Cars, and thin Skinned vehicles (pick-up trucks) Hot or Cold Targets.

SENSOR/SEEKER: Multi-Mode Seeker.

SUPPORTS GREYBEARD CAPABILITIES

- Increase range, accuracy & lethality
- Advanced propulsion
- Expand target sets
- Comprehensive counter-countermeasures
- Multi-service HTI

SCHEDULE:

- Seeker Proof of Principle Oct '02 – July '03
- TUAV Application Proof of Principle Aug '03-Sep '04.
- Build DT/OT Hardware FY05
- DT/OT FY06

CONTRACTOR: Northrop Grumman - Electronic Systems.

ACQUISITION PHASE: Proof of Principle.

MILESTONES & Deliveries: TBD

ARMY TRANSFORMATION: The strategy supports the seven FCS characteristics (Responsive, Deployable, Agile, Versatile, Lethal, Survivable, and Sustainable)

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
Product Manager	LTC John Oxford	john.oxford@msl.army.mil	(256) 876-2063
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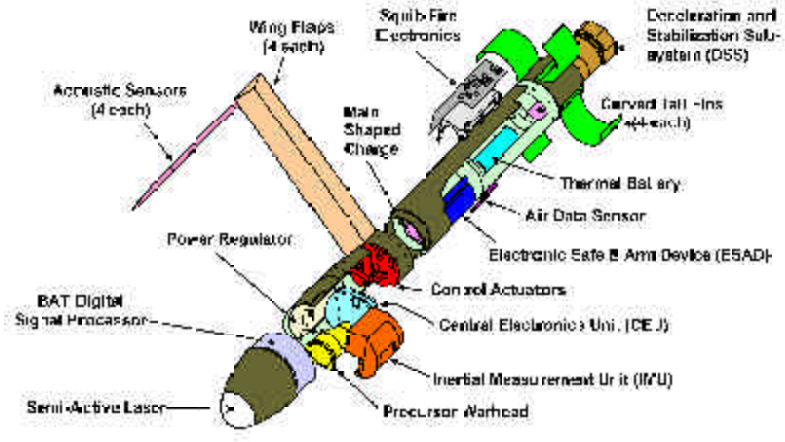
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

VIPER STRIKE
(SEMI-ACTIVE LASER SEEKER)

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: Viper Strike is a armed UAV submunition using a semi-active laser to provide a capability to attack moving and stationary targets ranging from armored to thin-skinned targets (MRLs, TELs, scuds, armored cars, pickup trucks, etc.) in a variety of obscured and countermeasured environments. The Viper Strike munition is deployed off a Hunter UAV. The Viper Strike System is a complementary system to the LAM/PAM concept.

SYSTEM CHARACTERISTICS: The objective of Viper Strike Seeker System is to destroy moving or stationary, and hot or cold targets using a semi-active laser seeker. The new Seeker provides for improved target detection and hit point accuracy. The Viper Strike System was demonstrated using day/night laser designators for pin-point accuracy especally in urban terrain. Diameter: 0.14 m (5.5 in). Length: 0.914 m (36 in). Weight: 20 Kg (44 lbs).

TARGET SETS: Armored Combat Vehicles, Moving and Stationary Targets, Surface-to-Surface Missiles, Transporter Erector Launchers, and Multiple Rocket Launchers, Armored Cars, and thin Skinned vehicles (pick-up trucks) Hot or Cold Targets.

SENSOR/SEEKER: Semi-Active Laser Seeker.

SUPPORTS GREYBEARD CAPABILITIES

- Increase range, accuracy & lethality
- Advanced propulsion
- Expand target sets
- Comprehensive counter-countermeasures
- Multi-service HTI

CONTRACTOR: Northrop Grumman - Electronic Systems.

ACQUISITION PHASE: Concept Demonstration.

MILESTONES & DELIVERIES:

- TUAV Application Proof of Principle	Complete
- Concept Demonstration	Mar 03 - Mar 04
- Build DT/OT Hardware	FY05
- DT/OT	FY06

ARMY TRANSFORMATION: The strategy supports the seven FCS characteristics (Responsive, Deployable, Agile, Versatile, Lethal, Survivable, and Sustainable)

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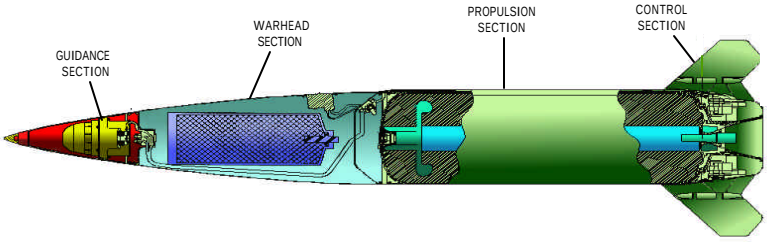
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM
ATACMS UNITARY

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: The Army TACMS Quick Reaction Unitary is a variant of the Army TACMS Block IA missile. The Quick Reaction Unitary (QRU) integrates an onboard Global Positioning System (GPS) into an inertial navigation system and replaces the payload of 300 M-74 bomblets with the Navy's WDU/18-B Unitary Warhead.

The Extended Range Unitary (ERU), a follow-on effort to the QRU, will use converted Army TACMS Block I missiles with an extended range motor, improved guidance set, optimized warhead, and multi-mode fuze. The QRU/ERU provides the Stryker Brigade Combat Team and Future Forces with a deep strike, point target system that minimizes collateral damage.

SYSTEM CHARACTERISTICS: The Army TACMS Block IA Quick Reaction Unitary (QRU) uses the guided missile control and propulsion systems of the Army TACMS Block IA missile. The QRU uses the same improved version of the Army TACMS Block IA Missile Guidance Set to achieve the improved accuracy needed to meet the QRU system requirements. The Improved Missile Guidance Set uses an embedded GPS receiver to receive and process GPS satellite navigation signals and integrates the GPS data into the inertial guidance scheme to improve navigational accuracy. There is one missile per launching assembly and two missiles per launcher load. Thrust for the missile is provided by a solid propellant rocket motor, which is ignited by an igniter arm/fire device. Payload Weight: 214 kg (470 lbs). Missile Length: 3.975 m (156.5 in.). Diameter: 0.61 m (23.9 in.). Maximum Range: 270 km (QRU), 499 km (ERU Objectives).

SENSOR/SEEKER: Not Applicable

WARHEAD: The Block IA Quick Reaction Unitary contains the WDU-18/B Navy unitary bomb which makes up a SLAM warhead designated as WAU-23/B. It has a total weight of 470 lbs of which 215 lbs is DESTEX explosive. The Navy FMU-141/B fuze interfaces with the Army TACMS ESAD via a pyrotechnically activated pneumatic system. The fragmenting material is steel.

TARGET SETS: Petroleum, Oil, and Lubricant (POL) sites, Multi-Story Buildings, Transformers, and Surface to Surface Missile Units.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Dallas

ACQUISITION PHASE:

QRU — Production and Deployment.
ERU — Concept Exploration.

MILESTONES:

QRU — Directed Production Go Ahead October 00.
ERU — Milestone B TBD.
Milestone C FY 07/FY 08.

FIELDING: 2Q FY 02, USFK/PACOM and Letterkenny Munitions Center.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
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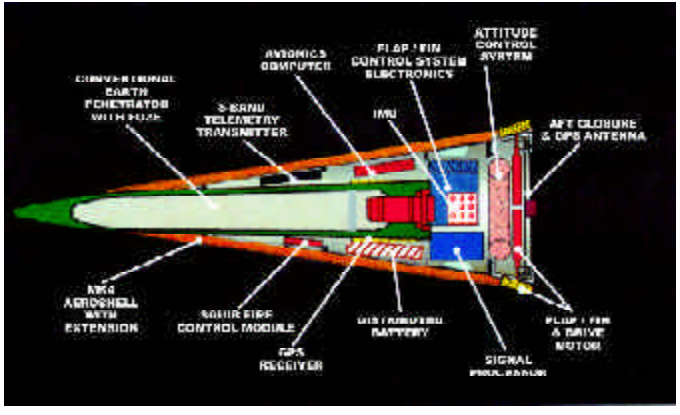
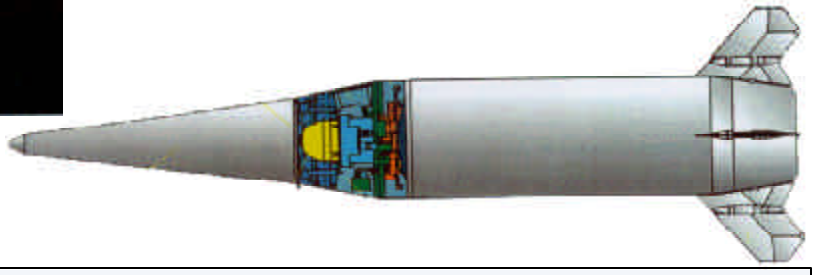
ASA(ALT)	Mr. John McVey	mcvey.john@saalt.army.mil	(703) 604-7218

ARMY TACTICAL MISSILE SYSTEM
ARMY TACMS PENETRATOR (ACTD)

Precision Fires Rocket & Missile Systems



SYSTEM DESCRIPTION: SYSTEM DESCRIPTION: The Army TACMS Penetrator Advanced Concept Technology Demonstration (ACTD) is a proof of concept which integrates a separating Navy Earth Penetrator/Re-entry Body (EP/RB) with the Army TACMS family of munitions (AFOM).



SYSTEM CHARACTERISTICS: SYSTEM CHARACTERISTICS: The Army TACMS Penetrator integrates a Navy separating re-entry earth penetrator with an ATACMS Block I missile. There is one missile per guided missile and launching assembly and two missiles per launcher load. Thrust for the missile is provided by a solid propellant rocket motor which is ignited by an igniter arm/fire device. Payload weight: 250 kg (550 lbs), Missile Length: 3.975 m (156.5 in), Diameter: 0.61 m (23.9 in), Weight: 1490 kg (3100 lbs). Maximum Range: 205 km. Minimum Range: 130 km.

SENSOR/SEEKER: Not Applicable

WARHEAD: The Navy Earth Penetrator/Re-entry Body (EP/RB) is currently under development at Sandia National Labs (SNL). The EP/RB separates from the TACMS booster approximately 50 seconds after launch and autonomously guides to the target with a GPS aided navigation set.

TARGET SETS: Hard and Deeply Buried Targets including Weapons of Mass Destruction, Command and Control Centers and Storage facilities.

CONTRACTOR: Lockheed Martin Missiles and Fire Control - Dallas Navy Contractor is sole sourced to Sandia National Labs

ACQUISITION PHASE: ACTD- Proof of concept.

MILESTONES: Three test flights beginning in FY 03.

FIELDING: Six residual assets will be delivered during FY 04.

POINTS OF CONTACT

PM	COL Earnest Harris	earnest.harris@msl.army.mil	(256) 876-1195
DPM	Mr. Wayne Burke	wayne.burke@msl.army.mil	(256) 876-8121
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BATTLEFIELD FRAMEWORK